

DIFFERENTIAL SPIN VALVE SENSOR HAVING BOTH PINNED AND SELF-PINNED STRUCTURES

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ABSTRACT OF THE DISCLOSURE

A dual/differential spin valve sensor of a magnetic head includes a first spin valve having an antiparallel (AP) “pinned” layer structure and a second spin valve having an AP “self-pinned” layer structure. The AP pinned layer structure has a magnetization direction which is fixed by an adjacent antiferromagnetic (AFM) layer, whereas the AP self-pinned layer structure has a magnetization direction which is fixed by magnetostriction as well as air bearing surface (ABS) stress. The magnetization direction of the AP pinned layer structure is fixed in a direction antiparallel to the magnetization direction of the AP self-pinned layer structure. The dual/differential spin valve sensor may be configured to have either a top AP pinned layer structure and a bottom AP self-pinned layer structure, or a top AP self-pinned layer structure and a bottom AP pinned layer structure. Advantageously, the dual/differential spin valve sensor is relatively thin and overcomes the difficulties of the AFM polarity setting process when two AP pinned layer structures are utilized.